

REMARKS

Applicants concurrently file herewith a Request for Continued Examination (RCE), thereby forcing entry of this amendment.

Claims 15-22 and 24 are all of the claims presently pending in the application. Claim 15 has been amended to more particularly define the invention. Claim 23 has been canceled without prejudice or disclaimer.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 15-24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Koike et al. (U.S. Patent No. 5,945,689) (hereinafter "Koike").

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention of exemplary claim 1 provides a light-emitting device including an emission layer and an n-layer made of $Al_xGa_{1-x}N$, wherein $0.03 \leq x \leq 0.06$, having a thickness from 150 nm to 250 nm (see Application at page 6, lines 12-13). This allows the claimed invention to improve the luminous efficiency of the light-emitting device (see Application at page 2, lines 21-23).

II. THE PRIOR ART REFERENCE

The Examiner alleges that the claimed invention of claims 15-24 would have been unpatentable in view of Koike. Applicants submit, however, that there are elements of the claimed invention, which are neither taught nor suggested by (nor made obvious in view of) Koike.

That is, Koike does not teach or suggest "*an n-layer comprising $Al_xGa_{1-x}N$, wherein $0.03 \leq x \leq 0.06$, having a thickness from 150 nm to 250 nm*" as recited in claim 15.

The Examiner attempts to rely on Figure 12 and column 6, lines 13-20 of Koike to support her allegations. The Examiner, however, is clearly incorrect.

That is, nowhere, in this figure nor this passage (nor anywhere else for that matter) does Koike teach or suggest a light-emitting device using a gallium nitride compound semiconductor including an n-layer made of $\text{Al}_x\text{Ga}_{1-x}\text{N}$, wherein $0.03 \leq x < 0.06$, having a thickness from 150 nm to 250 nm. Indeed, the Examiner does not even allege that Koike teaches or suggests this feature.

The Examiner merely alleges that *“it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a certain thickness for the buffer layer, n-layer and a certain temperature to form the buffer layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art”* (see Office Action dated March 21, 2005 at page 3).

However, Applicants have discovered the significance of the thickness of the n-layer. As pointed out in the Application, the emission layer and the n-layer, having the composition and thickness recited in exemplary claim 15, enable the claimed invention to improve the crystallinity of a layer formed on the n-layer. The combination of elements recited in claim 15 also prevents holes from diffusing to the substrate side of the light emitting device which are emitted from the emission layer and pass over the n-layer (see Application at page 6, lines 12-20). Applicants believe that the claimed range recited in claim 15 is an important contribution to the art for achieving the desired results of the claimed invention.

Applicants point out that MPEP 2144.05 states that “[t]he law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims”. That is, a specific range or other variable in a claim may provide patentable weight to a claim if the applicant can show that the particular range is important (see MPEP 2144.05). In order to anticipate this claimed range, the specific limitation must be disclosed in the reference with “sufficient specificity to constitute an anticipation under the statute” (see MPEP 2131.03). Koike does not even mention a relationship between the thickness of the n-layer and the crystallinity of a layer formed on the n-layer. That is, Koike clearly fails to recognize the significance of this parameter.

Furthermore, Applicants submit that the MPEP provides that “[a] particular parameter must first be recognized as a result-effective variable, i.e., **a variable which achieves a recognized result**, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation” (MPEP at §2144.05) (emphasis

added). Here, Koike does not teach or suggest that optimizing a thickness of the n-layer provides the desired results of the claimed invention.

That is, nowhere does Koike teach or suggest that the thickness of the n-layer may have any effect on the crystallinity of a layer formed on the n-layer. Certainly, Koike does not teach or suggest that the crystallinity of a layer formed on the n-layer is improved if the thickness of the n-layer is in a range of 150 nm to 250 nm. Therefore, it is clearly unreasonable to suggest that Koike teaches or suggests that the thickness of the n-layer is merely a result-effective variable.

Therefore, the specific range recited in exemplary claim 15 clearly shows a technical effect and is not arbitrarily selected to solve the problems presented in the Application.

As a result, the light-emitting device of the present invention can emit ultra-violet rays effectively. Especially, the claimed invention of exemplary claim 24 is effective for emitting ultra-violet rays. These features are not taught or suggested by (or made obvious in view of) Koike.

Therefore, Applicants submit that there are elements of the claimed invention that are not taught or suggest by Koike. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicants submit that claims 15-22 and 24, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

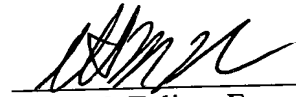
Serial No. 10/634,836
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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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